

ABSTRACT OF THE DISCLOSURE

A stepping motor comprises a permanent magnet type rotor with a plurality of poles secured to a rotating shaft and a stator having stator magnetic poles with stator magnetic pole teeth in which excitation windings are wound on a plurality of magnetic poles in a star or delta connection, wherein the rotor is magnetized in different directions alternately circumferentially to satisfy the following equation: $M = 4F / 3$ where M is the number of poles of the rotor and F is the number of the stator magnetic poles, the rotor is cylindrical in shape with the stator rotatably disposed inside, disposed opposing the surfaces of the stator magnetic pole teeth through an air gap which is of a uniform dimension throughout the circumference between the surfaces of the stator magnetic pole teeth of the stator and the rotor, and the surface magnetic flux distribution thereof has a substantially sinusoidal wave form circumferentially. The stepping motor realizes smooth rotation and simplification in the structure of the rotor. In addition, the present invention provides a stepping motor device using the above-mentioned stepping motor and a method of driving the device.